

**IN THE CLAIMS:**

Please amend claims 20-37; cancel claim 38 without prejudice or disclaimer; and add new claims 39-72 as follows.

Claims 1-19. (Cancelled)

20. (Currently Amended) A method, comprising:

~~for adaptive setting or reservation of channelization codes and/or power for downlink channel in a communication network, using parameters ( $SF_{min}$ ,  $P_{txD SCHallowed}$ ) for minimum allowed Spreading Factor, SF, and/or allowed power level, the parameters being set depending on the traffic load, the total cell load and/or the availability of channelization codes, wherein~~

performing at least three kinds of measurements comprising~~are performed:~~

~~1. A~~average transmitted power of a physical shared downlink channel, PDSCH,

~~2. R~~relative activity factor, A, of the PDSCH, and

~~3. W~~weighted code blocking rate, B,

wherein said performing of said measurements comprises using one or more parameters comprising a minimum allowed spreading factor ( $SF_{min}$ ) and an allowed power level of the downlink shared channel ( $P_{txD SCHallowed}$ ), the one or more parameters being set depending on one or more of traffic load, total cell load, and availability of channelization codes; and

adaptive adjusting adjustment of a root spreading factor based at least on the three kinds of measurements; and

adaptive adjusting of power for the downlink shared channel is based on these at least the three kinds of measurements.

21. (Currently Amended) The method of claim 20, wherein the one or more parameters comprise the allowed power level of the downlink shared channel ( $P_{\text{txDSC}^{\text{Hallowed}}}$ ), wherein the allowed power level of the downlink shared channel is adjusted, and wherein a criteria for adjustment of the allowed power level of the downlink shared channel is:

if A is smaller than  $TH_{A1}$ , and  $P_{\text{txDSC}^{\text{Hest}}}$  is smaller than  $(P_{\text{txPDSC}^{\text{Hallowed}}} - X)$ , then decrease ~~the~~ reserved power, preferably by X or a fraction thereof,

wherein A ~~representing~~ comprises the relative activity factor of the downlink shared channel an activity factor of the downlink channel,  $TH_{A1}$  comprises a threshold parameter,  $P_{\text{txDSC}^{\text{Hest}}}$  ~~the~~ comprises an estimated power of the downlink channel,  $P_{\text{txPDSC}^{\text{Hallowed}}}$  ~~the~~ comprises a power allowed for the physical shared downlink channel, and X comprises a certain set value.

22. (Currently Amended) The method of claim 20, wherein the parameters comprise the allowed power level of the downlink shared channel ( $P_{\text{txDSC}^{\text{Hallowed}}}$ ), wherein

the allowed power level of the downlink shared channel is adjusted, and wherein a criteria for adjustment of the allowed power level of the downlink shared channel is:

if  $A$  is greater than  $TH_{A2}$ , and  $P_{txDSCHeSt}$  is greater than  $(P_{txPDSCHallowed} - X)$ , then increase the allowed power by  $X$ ,

wherein  $A$  comprises ~~representing~~ the relative activity factor of the PDSCH-an activity factor of the downlink channel,  $TH_{A2}$  comprises a threshold parameter,  $P_{txDSCHeSt}$  ~~the~~ comprises an estimated power of the downlink channel,  $P_{txPDSCHallowed}$  ~~the~~ comprises a power allowed for the physical shared downlink channel, and  $X$  a certain set value.

23. (Currently Amended) The method of claim 20, wherein the parameters comprise the minimum allowed spreading factor ( $SF_{min}$ ), wherein the minimum spreading allowed factor is adjusted, and wherein a criteria for adjustment of the minimum allowed spreading factor,  $SF_{min,2}$  is:

if  $B$  is greater than  $TH_B$ , and  $A$  is greater than  $TH_{A2}$ , then decrease  $SF_{min}$  ~~(allow higher bit rates)~~,

wherein  $B$  representing ~~comprises~~ a weighted code-blocking rate,  $A$  comprises the relative activity factor of the PDSCH-an activity factor of the downlink channel, and  $TH_B$  and  $TH_{A2}$  comprise threshold values.

24. (Currently Amended) The method of claim 20, wherein the parameters comprise the minimum allowed spreading factor ( $SF_{min}$ ), wherein the minimum spreading

allowed factor is adjusted, and wherein a criteria for adjustment of the minimum allowed spreading factor,  $SF_{min}$ , is:

if  $B = 0$  (zero), and  $L_{code}$  is greater than  $TH_{code}$ , then increase  $SF_{min}$  ~~(maximum bit rate is decreased)~~,

wherein B comprises ~~representing~~ a weighted code-blocking rate,  $L_{code}$  comprises a current load of a code tree, and  $TH_{code}$  comprises a threshold parameter.

25. (Currently Amended) The method of claim 20, further comprising: ~~wherein a method for~~

allocating a channelization code,

wherein the allocation of the channelization code ~~allocation~~ comprises:

~~a step of~~ reserving a new root code with a given spreading factor ~~(Spreading Factor)~~, and

~~a subsequent step of~~ deciding where in a code tree this reservation is to be made.

26. (Currently Amended) The method of claim 25, wherein codes for downlink ~~basically~~ are assigned in the code tree starting from a certain limb of the code tree, and codes are assigned for users ~~primarily~~ in another limb of the code tree.

27. (Currently Amended) The method of claim 25, wherein a default capacity is allocated to a territory, ~~e.g. wherein DSCH~~ wherein DSCH ~~the territory to be is~~ used by HS-DSCH and

DSCH, when allowed by the a total code tree load ~~allows this~~, and wherein the spreading factor SF is ~~only~~ increased if when the code tree is highly loaded.

28. (Currently Amended) The method of claim 20, wherein the one or more parameters is set depending on at least the total cell load, and wherein the total cell load is measured by power.

29. (Currently Amended) A system apparatus, configured to:  
~~for adaptive setting or reservation of channelization codes and/or power for downlink channel in a communication network, using parameters ( $P_{txDSCHallowed}$ ,  $SF_{min}$ ) for minimum allowed Spreading Factor, SF, and/or allowed power level, the parameters being set depending on the traffic load, the total cell load and/or the availability of channelization codes,~~

~~wherein the system is adapted to perform at least three kinds of measurements comprising:~~

- ~~1. Average transmitted power of a physical shared downlink channel, PDSCH,~~
- ~~2. Rrelative activity factor, A, of the PDSCH, and~~
- ~~3. Wweighted code blocking rate, B,~~

wherein said resource manager is configured to use one or more parameters to perform of said measurements, said one or more parameters comprising a minimum allowed spreading factor ( $SF_{min}$ ) and an allowed power level of the downlink shared

channel ( $P_{\text{txDSCHallowed}}$ ), the one or more parameters being set depending on one or more of traffic load, total cell load, and availability of channelization codes;

and to base adjust adaptively adjustment of a root spreading factor based on the at least three kinds of measurements; and

adjust adaptively power for the downlink shared channel based on these at three kinds of measurements.

30. (Currently Amended) The system apparatus of claim 29, wherein the parameters comprise the allowed power level ( $P_{\text{txDSCHallowed}}$ ), wherein the allowed power level is adjusted, and wherein a criteria for adjustment of the allowed power level is:

if A is smaller than  $TH_{A1}$ , and  $P_{\text{txDSCHest}}$  is smaller than  $(P_{\text{txPDSCHallowed}} - X)$ , then decrease ~~the~~ reserved power, preferably by X or a fraction thereof,

wherein A comprise representing an activity factor of the downlink channel the relative activity factor of the PDSCCH,  $TH_{A1}$  comprises a threshold parameter,  $P_{\text{txDSCHest}}$  the comprises an estimated power of the downlink channel,  $P_{\text{txPDSCHallowed}}$  the a power allowed for the physical shared downlink channel, and comprises X a certain set value.

31. (Currently Amended) The system apparatus of claim 29, wherein the parameters comprise the allowed power level ( $P_{\text{txDSCHallowed}}$ ), wherein the allowed power level is adjusted, and wherein a criteria for adjustment of the allowed power level is:

if  $A$  is greater than  $TH_{A2}$ , and  $P_{txDSCHest}$  is greater than  $(P_{txPDSCHallowed} - X)$ , then increase the allowed power by  $X$ ,

wherein  $A$  comprises representing an activity factor of the downlink channel the relative activity factor of the physically shared downlink channel,  $TH_{A2}$  comprises a threshold parameter,  $P_{txDSCHest}$  the comprises an estimated power of the downlink channel,  $P_{txPDSCHallowed}$  the comprises a power allowed for the physically shared downlink channel, and  $X$  comprises a certain set value.

32. (Currently Amended) The system-apparatus of claim 29, wherein the parameters comprise the minimum allowed spreading factor ( $SF_{min}$ ), wherein the minimum spreading allowed factor is adjusted, and wherein a criteria for adjustment of the minimum allowed spreading factor,  $SF_{min,a}$  is:

if  $B$  is greater than  $TH_B$ , and  $A$  is greater than  $TH_{A2}$ , then decrease  $SF_{min}$  (allow higher bit rates),

wherein  $B$  representing comprises a weighted code-blocking rate,  $A$  an activity factor of the downlink channel comprises the relative activity factor of the PDSCH, and  $TH_B$  and  $TH_{A2}$  comprise threshold values.

33. (Currently Amended) The system-apparatus of claim 29, wherein the parameters comprise the minimum allowed spreading factor ( $SF_{min}$ ), wherein the

minimum spreading allowed factor is adjusted, and wherein a criteria for adjustment of the minimum allowed spreading factor,  $SF_{min,a}$  is:

if  $B = 0$  (zero), and  $L_{code}$  is greater than  $TH_{code}$ , then increase  $SF_{min}$  (maximum bit rate is decreased),

wherein B comprises ~~representing~~ a weighted code-blocking rate,  $L_{code}$  comprises a current load of a code tree, and  $TH_{code}$  comprises a threshold parameter.

34. (Currently Amended) The system apparatus of claim 29, wherein the resource manager is further configured to allocate a ~~method for channelization code allocation~~ comprises a step of by reserving a new root code with a given spreading factor-SF, and a ~~subsequent step of by~~ deciding where in a code tree this reservation is to be made.

35. (Currently Amended) The system apparatus of claim 34, wherein codes for downlink ~~basically~~ are assigned in the code tree starting from a certain limb of the code tree, and codes are assigned for users ~~primarily~~ in another limb of the code tree.

36. (Currently Amended) The system apparatus of claim 34, wherein a default capacity is allocated to a territory, ~~e.g. wherein DSCH the territory is to be used by HS-DSCH and DSCH,~~ when allowed by the a total code tree load ~~allows this, and~~ wherein spreading factor SF is ~~only~~ increased if when the code tree is highly loaded.



37. (Currently Amended) The ~~system apparatus~~ of claim 29, wherein the resource manager is configured to set the one or more parameters depending on at least being adapted to measure the total cell load, and wherein the total cell load is measured by measuring power.

38. (Cancelled)

39. (New) A computer-readable medium having computer-executable components configured to implement a method, the method comprising:

- performing at least three kinds of measurements comprising:
  - average transmitted power of a physical shared downlink channel, PDSCH,
  - relative activity factor, A, of the PDSCH, and
  - weighted code blocking rate, B,
- wherein said performing of said measurements comprises using one or more parameters comprising a minimum allowed spreading factor ( $SF_{min}$ ) and an allowed power level of the downlink shared channel ( $P_{txDSCHallowed}$ ), the one or more parameters being set depending on one or more of traffic load, total cell load, and availability of channelization codes;
- adaptive adjusting of a root spreading factor based at least on the three kinds of measurements; and

adaptive adjusting of a power for the downlink shared channel based on at least the three kinds of measurements.

40. (New) The computer-readable medium of claim 39, wherein the one or more parameters comprise the allowed power level of the downlink shared channel ( $P_{\text{txDSC}^{\text{Hallowed}}}$ ), wherein the allowed power level of the downlink shared channel is adjusted, and wherein a criteria for adjustment of the allowed power level of the downlink shared channel is:

if A is smaller than  $TH_{A1}$ , and  $P_{\text{txDSC}^{\text{Hest}}}$  is smaller than  $(P_{\text{txPDSC}^{\text{Hallowed}}} - X)$ , then decrease reserved power, preferably by X or a fraction thereof,

wherein A comprises the relative activity factor of the physically shared downlink channel,  $TH_{A1}$  comprises a threshold parameter,  $P_{\text{txDSC}^{\text{Hest}}}$  comprises an estimated power of the downlink channel,  $P_{\text{txPDSC}^{\text{Hallowed}}}$  comprises a power allowed for the physical shared downlink channel, and X comprises a certain set value.

41. (New) The computer-readable medium of claim 39, wherein the parameters comprise the allowed power level of the downlink shared channel ( $P_{\text{txDSC}^{\text{Hallowed}}}$ ), wherein the allowed power level of the downlink shared channel is adjusted, and wherein a criteria for adjustment of the allowed power level of the downlink shared channel is:

if A is greater than  $TH_{A2}$ , and  $P_{\text{txDSC}^{\text{Hest}}}$  is greater than  $(P_{\text{txPDSC}^{\text{Hallowed}}} - X)$ , then increase the allowed power by X,

wherein A comprises the relative activity factor of the PDSCH,  $TH_{A2}$  comprises a threshold parameter,  $P_{txDSCHest}$  comprises an estimated power of the downlink channel,  $P_{txPDSCHallowed}$  comprises a power allowed for the physical shared downlink channel, and X a certain set value.

42. (New) The computer-readable medium of claim 39, wherein the parameters comprise the minimum allowed spreading factor ( $SF_{min}$ ), wherein the minimum spreading allowed factor is adjusted, and wherein a criteria for adjustment of the minimum allowed spreading factor,  $SF_{min}$ , is:

if B is greater than  $TH_B$ , and A is greater than  $TH_{A2}$ , then decrease  $SF_{min}$ ,

wherein B comprises a weighted code-blocking rate, A comprises the relative activity factor of the PDSCH, and  $TH_B$  and  $TH_{A2}$  comprise threshold values.

43. (New) The computer-readable medium of claim 39, wherein the parameters comprise the minimum allowed spreading factor ( $SF_{min}$ ), wherein the minimum spreading allowed factor is adjusted, and wherein a criteria for adjustment of the minimum allowed spreading factor,  $SF_{min}$ , is:

if  $B = 0$  (zero), and  $L_{code}$  is greater than  $TH_{code}$ , then increase  $SF_{min}$ ,

wherein B comprises a weighted code-blocking rate,  $L_{code}$  comprises a current load of a code tree, and  $TH_{code}$  comprises a threshold parameter.

44. (New) The computer-readable medium of claim 39, further comprising:  
allocating a channelization code,  
wherein the allocation of the channelization code comprises:  
reserving a new root code with a given spreading factor, and  
deciding where in a code tree this reservation is to be made.

45. (New) The computer-readable medium of claim 44, wherein codes for  
downlink are assigned in the code tree starting from a certain limb of the code tree, and  
codes are assigned for users in another limb of the code tree.

46. (New) The computer-readable medium of claim 44, wherein a default  
capacity is allocated to a territory, wherein the territory is used by HS-DSCH and DSCH  
when allowed by a total code tree load, and wherein the spreading factor is increased  
when the code tree is highly loaded.

47. (New) The computer-readable medium of claim 39, wherein the one or more  
parameters is set depending on at least the total cell load, and wherein the total cell load  
is measured by power.

48. (New) A method, comprising:  
performing at least three kinds of measurements comprising:

average transmitted power of a physical downlink shared channel, PDSCH,  
relative activity factor,  $A$ , of the physical downlink shared channel, the relative  
activity factor  $A$  defining the ratio between silence and activity of the physical downlink  
shared channel during an observation period, and

weighted code blocking rate,  $B$ , the weighted code blocking rate  $B$  being defined  
as the relative time during observation period where a larger bit rate than the actually  
allocated bit rate could have been allocated to a user equipment according to a link  
adaption criteria for controlling the downlink shared channel;

adaptive adjusting of a root spreading factor and adaptive adjusting of a power for  
the downlink shared channel based on at least the three kinds of measurements,

setting parameters for at least one of a minimum allowed spreading factor and an  
allowed power level depending on at least one of traffic load, a total load of a cell and  
availability of channelization codes.

49. (New) The method of claim 48, wherein a criteria for adjustment of the  
allowed power level is:

if  $A$  is smaller than  $TH_{A1}$ , and  $P_{txDSCHest}$  is smaller than  $(P_{txPDSCHallowed} - X)$ ,  
decrease the reserved power,

$A$  representing an activity factor of the downlink channel,  $TH_{A1}$  a threshold  
parameter,  $P_{txDSCHest}$  the estimated power of the downlink channel,  $P_{txPDSCHallowed}$  the  
power allowed for the downlink channel, and  $X$  a certain set value.

50. (New) The method of claim 48, wherein a criteria for adjustment of the allowed power level is:

if  $A$  is greater than  $TH_{A2}$ , and  $P_{txDSCHest}$  is greater than  $(P_{txPDSCHallowed} - X)$ , increase the allowed power by  $X$ ,

$A$  representing an activity factor of the downlink channel,  $TH_{A2}$  a threshold parameter,  $P_{txDSCHest}$  the estimated power of the downlink channel,  $P_{txPDSCHallowed}$  the power allowed for the downlink channel, and  $X$  a certain set value.

51. (New) The method of claim 48, wherein a criteria for adjustment of the minimum spreading factor,  $SF_{min}$ , is:

if  $B$  is greater than  $TH_B$ , and  $A$  is greater than  $TH_{A2}$ , decrease  $SF_{min}$ , allowing higher bit rates,

$B$  representing a weighted code-blocking rate,  $A$  an activity factor of the downlink channel, and  $TH_B$  and  $TH_{A2}$  threshold values.

52. (New) The method of claim 48, wherein a criteria for adjustment of the minimum spreading factor,  $SF_{min}$ , is:

if  $B = \text{zero}$ , and  $L_{code}$  is greater than  $TH_{code}$ , increase  $SF_{min}$ , decreasing maximum bit rate,

$B$  representing a weighted code-blocking rate,  $L_{code}$  a current load of a code tree, and  $TH_{code}$  a threshold parameter.

53. (New) The method of claim 48, wherein a method for channelization code allocation comprises a step of reserving a new root code with a given spreading factor, and a subsequent step of deciding where in a code tree this reservation is to be made.

54. (New) The method of claim 53, wherein codes for downlink basically are assigned in the code tree starting from a certain limb of the code tree, and codes are assigned for users primarily in another limb of the code tree.

55. (New) The method of claim 53, wherein a default capacity is allocated to a territory, when the total code tree load allows this, wherein spreading factor is only increased if the code tree is highly loaded.

56. (New) The method of claim 48, wherein total cell load is measured by power.

57. (New) The method of claim 48, wherein the downlink shared channel is a high speed downlink shared channel, HS-DSCH.

58. (New) The method of claim 57, wherein the high speed downlink shared channel, HS-DSCH, is part of a high speed downlink packet access, HSDPA.

59. (New) The method of claim 57, wherein the high speed downlink shared channel, HS-DSCH, is mapped to a high speed physical downlink shared channel, HS-PDSCH.

60. (New) An apparatus configured to:  
perform three kinds of measurements comprising:  
average transmitted power of a physical downlink shared channel, PDSCH,  
relative activity factor, A, of the PDSCH, the relative activity factor A  
defining the ratio between silence and activity of the PDSCH during an  
observation period, and  
weighted code blocking rate, B, the weighted code blocking rate B being  
defined as the relative time during observation period where a larger bit rate than  
the actually allocated bit rate could have been allocated to a user equipment  
according to a link adaption criteria for controlling the downlink shared channel;  
base adaptive adjustment of at least one of a root spreading factor and an allowed  
power for the downlink shared channel on these three kinds of measurements,



set parameters for at least one of a minimum allowed spreading factor and an allowed power level depending on at least one of traffic load, a total load of a cell and availability of channelization codes.

61. (New) The apparatus of claim 60, wherein a criteria for adjustment of the allowed power level is:

if  $A$  is smaller than  $TH_{A1}$ , and  $P_{txDSCHest}$  is smaller than  $(P_{txPDSCHallowed} - X)$ , decrease the reserved power,

$A$  representing an activity factor of the downlink channel,  $TH_{A1}$  a threshold parameter,  $P_{txDSCHest}$  the estimated power of the downlink channel,  $P_{txPDSCHallowed}$  the power allowed for the downlink channel, and  $X$  a certain set value.

62. (New) The apparatus of claim 60, wherein a criteria for adjustment of the allowed power level is:

if  $A$  is greater than  $TH_{A2}$ , and  $P_{txDSCHest}$  is greater than  $(P_{txPDSCHallowed} - X)$ , increase the allowed power by  $X$ ,

$A$  representing an activity factor of the downlink channel,  $TH_{A2}$  a threshold parameter,  $P_{txDSCHest}$  the estimated power of the downlink channel,  $P_{txPDSCHallowed}$  the power allowed for the downlink channel, and  $X$  a certain set value.

63. (New) The apparatus of claim 60, wherein a criteria for adjustment of the minimum spreading factor,  $SF_{min}$ , is:

if  $B$  is greater than  $TH_B$ , and  $A$  is greater than  $TH_{A2}$ , decrease  $SF_{min}$ , allowing higher bit rates,

$B$  representing a weighted code-blocking rate,  $A$  an activity factor of the downlink channel, and  $TH_B$  and  $TH_{A2}$  threshold values.

64. (New) The apparatus of claim 60, wherein a criteria for adjustment of the minimum spreading factor,  $SF_{min}$ , is:

if  $B = \text{zero}$ , and  $L_{code}$  is greater than  $TH_{code}$ , increase  $SF_{min}$ , decreasing maximum bit rate,

$B$  representing a weighted code-blocking rate,  $L_{code}$  a current load of a code tree, and  $TH_{code}$  a threshold parameter.

65. (New) The apparatus of claim 60, configured to channelization code allocation, to reserve a new root code with a given spreading factor  $SF$ , and to decide where in a code tree this reservation is to be made.

66. (New) The apparatus of claim 65, configured to assign codes for downlink in the code tree starting from a certain limb of the code tree, and to assign codes for users in another limb of the code tree.

67. (New) The apparatus of claim 65, wherein a default capacity is allocated to a territory, when the total code tree load allows this, wherein spreading factor SF is only increased if the code tree is highly loaded.

68. (New) The apparatus of claim 60, being configured to measure the total cell load by measuring power.

69. (New) The apparatus of claim 60, wherein the downlink shared channel is a high speed downlink shared channel, HS-DSCH.

70. (New) The apparatus of claim 69, wherein the high speed downlink shared channel, HS-DSCH, is part of a high speed downlink packet access, HSDPA.

71. (New) The apparatus of claim 69, configured to map the high speed downlink shared channel, HS-DSCH, to a high speed physical downlink shared channel, HS-PDSCH.

72. (New) The apparatus of claim 29, wherein the apparatus comprises a resource manager.